

Claims

- 5 1. A composition for coating a metal substrate which is intended to be fabricated and overcoated, said composition comprising a silica or silicate binder, characterized in that the binder comprises an aqueous silica sol or alkali metal silicate having a  $\text{SiO}_2/\text{M}_2\text{O}$  mole ratio of at least 6:1, where M represents total alkali metal and ammonium ions, and wherein the silica or silicate particles have an average size equal to or smaller than 10 nm.
- 10 2. A coating composition according to claim 1, characterized in that the binder is a silica sol of  $\text{SiO}_2/\text{M}_2\text{O}$  mole ratio at least 25:1.
- 15 3. A coating composition according to claim 1 or claim 2, characterized in that the binder comprises an aqueous solution of an alkali metal or ammonium silicate stabilized by a silicate substituted by at least one anionic group of lower pKa than silicic acid, having a pH of 7 to 10.5 prepared by lowering the pH of a solution of silicate and silicate by ion exchange.
- 20 4. A coating composition according to any of claims 1 to 3, characterized in that the coating composition further comprises zinc powder and/or a zinc alloy.
- 25 5. A coating composition according to any of claims 1 to 4, characterized in that the silica particles have an average size in the range 3 nm to 10 nm.
6. A coating composition according to any of claims 1 to 5, characterized in that the binder further comprises a silane coupling agent.
- 30 7. A coating composition according to any of claims 1 to 6, characterized in that the binder further comprises an organic resin.

8. A coating composition according to any of claims 1 to 7, characterized in that it is a water-based shop primer.

5 9. Water-based shop primer for the coating of steel substrates which are intended to be fabricated and overcoated, said composition having a solid content of 20 - 40 % by volume, comprising:

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- an aqueous silica sol or alkali metal silicate binder having a  $\text{SiO}_2/\text{M}_2\text{O}$  mole ratio of at least 6:1, where M represents total alkali metal and ammonium ions, and wherein the silica or silicate particles have an average size equal to or smaller than 10 nm,
- 10 - 90 % by volume of the coating on a dry film basis of zinc powder and/or a zinc alloy having a mean particle size in the range 2 to 12  $\mu\text{m}$ ,
- 0 - 35 % by weight, based on silica or silicate, of an organic resin,
- 0 - 30 % by weight, based on silica or silicate, of a silane coupling agent,
- optionally non-zinc pigment(s) having a mean particle size below 3  $\mu\text{m}$ , and
- optionally a pot-life extender.

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